

IN THE SPECIFICATION:

On page 2, the paragraph on lines 2-14, please replace with the following:

As a prior art to solve the problem, for example, there is a method for electrically insulating a coating material tank from the ground. According to the method, high voltage can be applied between a charge electrode of an electrostatic coating spray gun and a substance to be coated, wherein coating material particles can be electrified. However, it is necessary that painting or coating work is interrupted when supplementing a coating material since high voltage is applied to the coating material tank, or a special coating material supplementing apparatus (for example, refer to JP-A-2002-143730 Patent Document 1) is required, which supplies a coating material in a state where electric insulation from the coating material tank is maintained.

Therefore, it is inconvenient.

On page 2, the paragraph on line 15 through page 3, line 2, please replace with the following:

As another solving means, there is a system called an “external electrode system” in which one or a plurality of external electrodes is (are) disposed at an outward position in the diametrical direction from an electrostatic coating spray gun, and high voltage is applied thereto. In this system, there is a system (for example, refer to JP-A-H06-134353 Patent Document 2) in which a rotary atomizer head is used to atomize a coating material in an electrostatic coating spray gun, and an air spray system (for example, JP-A-H09-136047 Patent Document 3) in which compressed air is used. In both systems, since there is no case where an external electrode for applying high voltage is brought into contact with a coating material whose electric resistance is low, it is possible to electrify coating material particles with the coating material tank grounded. Accordingly, no special apparatus is required to supply a coating material into a coating material tank, wherein continuous coating is enabled.

On page 3, the paragraph on lines 12-20, please delete in its entirety the following:

[Patent Document 1]

~~Japanese Published Unexamined Patent Application No. 2002-143730~~

[Patent Document 2]

~~Japanese Published Unexamined Patent Application No. H06-134353~~

[Patent Document 3]

~~Japanese Published Unexamined Patent Application No. H09-136047~~

On page 3, line 23 through page 4, line 2, please replace with the following:

The invention was made developed based from such backgrounds. It is therefore an object of the invention to provide an air spray type electrostatic coating spray gun that can be used for electrostatic coating using an aqueous coating material and metallic coating material whose electric resistance is relatively low, is able to carry out coating with its coating material tank grounded, and has a compact structure in which no electrode is provided outside the main body.

On page 4, line 3 through page 5, line 9, please delete the paragraph in its entirety and replace with the following:

An embodiment of the invention features an electrostatic coating spray gun for electrifying a coating material atomized by compressed air using high voltage and coating the same onto a substance to be coated. The spray gun preferably has a barrel constituting a main body of the spray gun, an air cap mounted on a front of the barrel, a coating material delivery port which is defined in a central part of the air cap and is open outwardly. Further featured is a centralized electrode protruding forward through the coating material delivery port, a pair of projections formed at respective radial upper and lower positions of the air cap while sandwiching the centralized electrode therebetween, and the projections protruding farther forward than the coating material delivery port. There is further preferably provided a pattern air flow channel formed in the projections so that compressed air is spouted inwardly forward with respect to the projections as well as a pair of insulatively shielded electrodes accommodated in the respective projections and having respective surfaces covered with an electrically insulating material. There is also preferably featured an arrangement wherein the centralized electrode is grounded and a high DC voltage is applied between the centralized electrode and the insulatively shielded electrodes.

On page 5, lines 9-21, please delete the paragraph in its entirety and replace with the following:

An embodiment of the invention features an electrostatic coating spray gun for electrifying a coating material atomized by compressed air using high voltage and coating the same onto a substance to be coated. The spray gun preferably has a barrel constituting a main body of the spray gun, an air cap mounted on a front of the barrel, a coating material delivery port which is defined in a central part of the air cap and is open outwardly. Further featured is a centralized electrode protruding forward through the coating material delivery port, and at least one projection projecting forward from the coating material delivery port and positioned within a circumferential region extending about said centralized electrode, and the at least one projection forming part of the air cap so that the projection is radially spaced from the centralized electrode and the at least one projection receives an insulatively shielded electrode which shielded electrode has a surface covered with an electrically insulating material, and the insulatively shielded electrode is accommodated in the interior of the projection, wherein high dc voltage is applied between the centralized electrode and the insulatively shielded electrode.

On page 5, line 22 through page 6, line 3, please delete the paragraph in its entirety.

On page 6, lines 11-28, please delete the paragraph in its entirety.

On page 7, lines 1-23, please revise the paragraph as follows:

According to the electrostatic coating spray gun of such a structure, since the surface of the electrode to which high dc voltage is applied is covered up with an electrically insulating material, no current is allowed to flow between the insulatively shielded electrodes ~~13a, 13b~~ and the pin electrode [[31]]. Therefore, high voltage can be applied in a state where the interval between the insulatively shielded electrodes ~~13a, 13b~~ and the pin electrode [[31]] is made comparatively narrow, wherein an intensive electric field can be generated in the vicinity of the pin electrode [[31]], in particular, in the vicinity of the tip end thereof, coating material particles atomized by atomization air can be electrified with the inverse polarity of the polarity of the insulatively shielded electrodes ~~13a and 13b~~. The electrified coating material particles are conveyed in close proximity to a substance to be coated by means of pattern air, and can be coated onto the substance to be coated, by means of an electrostatic force. With such an action, according to the electrostatic coating spray gun, it is possible to carry out electrostatic coating of not only a solvent-based coating material but also an aqueous coating material and metallic coating material whose electric resistance is relatively low. In addition, since such an external electrode as in the prior art is not required, the spray gun can be formed compact.

On page 9, lines 13-25, please revise the paragraph as follows:

Hereinafter, a description is given of Embodiment 1 of an electrostatic coating spray gun (hereinafter called a “spray gun”) according to the invention with reference to FIG. 1 through FIG. 5 [[6]]. A spray gun according to the embodiment mainly uses, as a coating material, aqueous coating material or metallic coating material whose electric resistance is relatively low. FIG. 2 depicts a longitudinal sectional view of the entire structure of a spray gun 1 according to the embodiment. FIG. 1 depicts a longitudinal sectional view of the tip end region. FIG. 3 depicts a front elevational view of a tip end air cap 40 described later. FIG. 4 depicts a front elevational view of the tip end region of the spray gun 1 with its air cap 40 removed, and FIG. 5 depicts an example of a circuit that generates high voltage.

On page 17, line 15 through page 18, line 7, please revise the paragraph as follows:

Since the pin electrode 31 is grounded by utilizing conductivity of a coating material, an intensive electric field directed from the surface of the pin electrode 31 to the electrode 13 to which high voltage is applied is generated. Therefore, a large amount of charges having the inverted polarity of the polarity of the high voltage of the electrode 13 is induced on the surface of the coating material having conductivity, which runs on the surface of the pin electrode 31. Also, as soon as the trigger 28 is pulled, compressed air passed through the atomization air flow channel 33 passes through the narrow clearance between the inner periphery of the atomization air spout hole 32 and the outer periphery of the coating material delivery port 30 and is spouted forward as atomization air. The atomization air is brought into collision with coating material running on the surface of the electrode 31 [[13]] and atomizes the coating material by the spraying principle. Simultaneously with spouting of the atomization air, compressed air supplied from the atomization air flow channel 33 is spouted from the sub-pattern air spout holes 38a as the sub-pattern air. The sub-pattern air also takes on an additional role for atomization of the coating material.

On page 26, line 27 through page 27, line 10, please replace with the following:

A point at which the present embodiment differs from Embodiment 1 resides in the shapes of the electrode 13 and the air cap 40. The other construction thereof is the same as that of Embodiment 1. An air cap 40 according to the present embodiment covers up the tip end surface side of the coating material nozzle 24, is made of an insulative synthetic resin material and is formed to be double-cylindrical. The air cap 40 is attached so that the end face of the inner cylinder 40b [[40g]] is airtightly pressed to the outer peripheral tip end portion of the coating material nozzle 24, and is fixed by a retaining nut 37 screwed in the outer peripheral surface of the front end cylindrical section 36 of the barrel 2.

On page 27, lines 11-20, please replace with the following:

A portion surrounded by the inner cylinder 40b [[40g]], the tapered tip end portion of the coating material nozzle 24 and the rear surface of the air cap 40 composes an annular atomization air flow channel 33a, and constructs a flow channel of atomization air,

communicating with the atomization air flow channel 33 in the coating material nozzle 24. Further, space between the inner cylinder 40b [[40g]] and the outer cylinder 40h of the air cap 40 communicates with the pattern air flow channel 45 formed outside in the diametrical direction of the coating material nozzle 24 and forms a flow channel of the pattern air.

On page 28, lines 8-16, please replace with the following:

Also, square sections 40d and 40e oppose each other and projecting forward are formed between the inner cylinder 40b [[40g]] and the outer cylinder 40h in the vertical direction including the center axis of the front side wall portion 40a. A plurality of pattern air spout holes 38 (in FIG. 12, two holes at the upper and lower sides), which communicate with the above-described pattern air flow channels 45, are formed at the respective square sections 40d and 40e, and pattern air being compressed air is diagonally spouted inwardly forward.

On page 29, lines 21-24, please replace with the following:

Next, a description is given of operations and actions of the spray gun 1 according to the present embodiment thus constructed, with reference to a schematic diagram depicting connections of the electric system depicted in FIG. 14 [[15]].